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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,381	09/12/2003	Robert Dubrow	40-002810US	6710

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QUINE INTELLECTUAL PROPERTY LAW GROUP, P.C.
P O BOX 458
ALAMEDA, CA 94501

EXAMINER

MAYES, MELVIN C

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/661,381

Applicant(s)

DUBROW, ROBERT

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-64 is/are pending in the application.
- 4a) Of the above claim(s) 3,24,39,41 and 45 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-23,25-38,40,42-44,46-56 and 61-64 is/are rejected.
- 7) ☒ Claim(s) 57-60 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

(1)

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 25, 2005 has been entered.

Claim Objections

(2)

Claim 56 objected to because of the following informalities: "though" should be "through." Appropriate correction is required.

Claim Interpretation

(3)

Claims 40 and 43 claim "semiconductor nanofibers." The specification describes semiconducting material as: material of a first element from group 2 or 12 and second element from group 16; material of first element from group 13 and second element from group 15; material of a group 14 element; material such as PbS, PbSe, PbTe, AlS, AlP and AlSb; or an alloy or mixture thereof [0068]. The phrase "semiconductor" in the claims is interpreted to be any of these described materials.

Claim Rejections - 35 USC § 112

(4)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(5)

Claims 44 and 61-64 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 44 claims that one or more of the first surface(s) comprises a plurality of nanofibers. Does this mean that not only is there a layer of semiconductor nanofibers between the first surfaces but also that one or both of the first surfaces also comprises nanofibers? If the nanofibers of Claim 44 are meant to be the semiconductor nanofibers already claimed in Claim 43, how can the nanofibers be both between first surfaces and also comprise the first surface(s)? This is not clear.

Claim 61 recites the limitation "the plurality of **semiconductor** nanofibers." There is insufficient antecedent basis for this limitation in Claims 1 and 23 from which it depends. Semiconductor nanofibers are only claimed in Claim 40.

Claim Rejections - 35 USC § 102 and 103

(6)

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

(7)

Claims 1, 2, 4-20, 22, 23, 25-38, 40, 42-44 and 46-56 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Knowles 2004/0071870.

Knowles 2004/0071870 discloses a method of making and using a tape that sticks by intermolecular (van der Waals) forces comprising: providing a base, carbon fibers bonded to the base and carbon nanotubes (semiconductor nanofibers) deposited onto the tips of the carbon fibers and arranged in a “mop” and configured to form a strong van der Waals bond when pressed against a mating surface. The nanotubes are grown on the fibers by PE-CVD. The nanotubes can be coated with SiC. The adhesive strength of the nanofibers ranges from 2.6 (1.8 N/cm²) to hundreds of psi, and nanotubes are packed to a density of 10⁶-10⁷/mm² (entire document, Fig. 6C).

The subject matter used in the present rejection is properly supported by the provisional application 60/390239 filed June 17, 2002.

Further, by arranging carbon nanotubes in a “mop” on the tips of the carbon fibers as shown in Figure 6, nanofibers are obviously provided attached to first surface and in which a portion contact the mating (second) surface on a side surface of the nanofibers, as claimed.

(8)

Claims 1, 2, 4-23, 25-38, 40, 42-44 and 46-56 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 99/40812.

WO 99/40812 discloses a method of micro-fastening comprising: attaching functionalized nanotubes to first and second substrates; and joining the substrates by the nanotubes, the extending nanotubes becoming mechanically interconnected. The functionalized nanotubes are in a variety of non-linear forms such as hooks and loops and spirals. The substrates are formed of metals, carbon, silicone, germanium, polymers or composites thereof, and the nanotubes may be composed of carbon, nitrogen, boron (semiconductive). Surface bonds based on the nanotubes, while extremely strong, may be re-opened and re-closed (entire document).

Further, by joining substrates having attached functionalized carbon nanotubes of non-linear forms such as hooks and loops and spirals, at least a portion of nanofibers of a first surface or between surfaces obviously contact a second surface or second article (the nanotubes of the second substrate) on the side surface of the nanofibers and obviously create van der Waals forces sufficient to adhere the surfaces together, as claimed, because the presence of nanotubes facilitates intimate atomic contact with the other nanotubes resulting in van der Waals forces and thus adhesion between the nanofibers and thus adhesion between the surfaces.

The surface density of nanofibers, density of contact points or percent contact area, as claimed, would depend on the desired amount of micro-fastening desired.

(9)

Claims 1, 2, 4-12, 22, 23 and 25-38 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lee et al. 2004/0098023.

Lee et al. disclose a method of implanting a vaso-occlusive device comprising: providing a device comprising polymer or metal core member and fibrous structure coupled on the core member; and inserting the device into a body cavity (second surface or article). The fibrous structure includes polymer nanofibers (entire document).

Further, by inserting a vaso-occlusive device having a fibrous structure of polymer nanofibers in a body cavity, at least a portion of nanofibers of a first surface (device) obviously contact a second surface or second article (body cavity) on the side surface of the nanofibers and obviously create van der Waals forces sufficient to adhere the surfaces together and friction forces which adhere the articles, as claimed, because the presence of nanofibers facilitates intimate atomic contact with the surface of the body cavity resulting in van der Waals forces and thus adhesion between the device and body cavity.

(10)

Claims 1, 2, 4-12, 14-20, 23 and 25-38 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Nakayama et al. 6,669,256.

Nakayama et al. disclose a method of using nanotweezers comprising: providing nanotweezers comprising a plurality of nanotubes whose base ends are fastened to a holder (first surface or first article) so as to protrude from the holder. The nanotubes can be carbon nanotubes or BN nanotubes or BCN nanotubes; and gripping a nano-substance (second surface or second article) with the nanotweezers. The holder can be made of silicon or silicon nitride (col. 1-16).

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Further by providing the nanotweezers of nanotubes for gripping nano-substance, the gripping (contacting) obviously creates van der Waals forces between the nanotubes and nano-substance (second surface or article) sufficient to adhere the surfaces together, as claimed, because the presence of nanotubes facilitates intimate atomic contact with the nano-substance resulting in van der Waals forces and thus adhesion between the nanotweezers and the nano-substance.

Allowable Subject Matter

(11)

Claims 57-60 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

(12)

Claims 61-64 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Arguments

(13)

Applicant's arguments filed May 25, 2005 have been fully considered but they are not persuasive.

Applicant argues that the claims have been amended to point out that it is the van der Waals forces that substantially generate the adhesion between the surfaces.

(14)

Applicant states that the claims have been amended to point out that it is the van der Waals forces that substantially generates the adhesion between the surfaces; however, the claims do not state adhering the surfaces substantially by van der Waals forces but merely state that the contacting creates van der Waals forces sufficient to adhere the surfaces together. As claimed, this does not exclude using other means of attaching such as fastening nanotubes (WO 99/40812) which, due to the very presence of nanotubes and the intimate atomic contact they provide, would also create van der Waals forces between the nanotubes and thus adherence between the surfaces. Applicant is not claiming to what degree the surfaces are adhered by van der Waals forces, only that enough (sufficient) van der Waals forces are created by the contact to adhere the surfaces. The Examiner's position is that if there are nanotubes or nanofibers present on at least one of the surfaces, van der Waals forces are created when the nanofibers contact another surface and thus result in some adherence and thus van der Waals forces "sufficient to adhere the surfaces together." Applicant's own specification states that nanofibers allow close access between the fibers and a secondary substrate which activates van der Waals forces between the fibers and secondary surface and so generates adhesion [0024].

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Conclusion

(15)

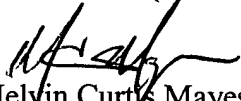
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(16)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Melvin Curtis Mayes
Primary Examiner
Art Unit 1734

MCM
August 22, 2005